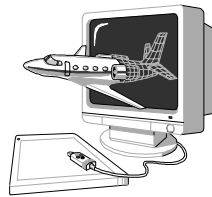


FAA National Software Conference, June 2001

FAA Airborne Activities

FAA's Aircraft Certification Software Activities



Leanna Rierson
(Leanna.Rierson@faa.gov)
June 5, 2001

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Outline

- **Where We've Been (1996-2000)**
- **Where We Are (2001)**
- **Where We're Going (beyond 2001)**

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FAA Airborne Activities

**Where We've
Been
1996-2000**

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Past Accomplishments

- Software Grand Design (96-99)
- Streamlining Software Aspects of Certification (97-99)
 - <http://shemesh.larc.nasa.gov/ssac/>
- Technical ReUsable Software Team (99-00)
- Establishing Annual Software Conference (99)
- Establishing Software Training and Policy (97 & on)
- Some Research Activities

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FAA Airborne Activities

**Where We
Are
(2001)**

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Software Steering Team (SST)

- **Purpose: To Implement Continuous Improvement**
- **Examples of areas for improvement:**
 - Policy
 - Training
 - Staffing
- **Began October 1999**
- **Members from Certification Offices, Directorates, and Headquarters**
- **Meet 2X per Year**

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FAA Airborne Activities

Certification Authorities Software Team (CAST) (1/2)

- **International Team of Software/Certification Specialists**
- **Meet 2X per Year**
- **Support Industry Software Committees**
- **Harmonize Among Certification Authorities on Software Issues**
- **Develop Position Papers**

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Certification Authorities Software Team (CAST) (2/2)

- **Example of Papers in Work:**
 - **Software Partitioning/Protection**
 - **Software ReUse in Certification Projects**
 - **Neural Nets in Aviation**
 - **Transferring of Software Via Internet/E-mail**
 - **Masking MC/DC**

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FAA Airborne Activities

Software Policy

- **FAA Software Notices Completed**
 - 8110.77 → .95 Field Loadable Software
 - 8110.78 → .89 Legacy Software
 - 8110.79 → .93 Parts Manufacturers Approval of Field Loadable Software
 - 8110.81 → .90 Software Review Process
 - 8110.82 → .92 Previously Developed Software
 - 8110.83 → .91 Software Tool Qualification
 - 8110.84 → .94 User Modifiable Software
 - 8110.85 Software Change Impact Analysis
 - 8110.86 Software Conformity
 - 8110.87 Level of FAA Involvement

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Software Policy (cont)

- **Policy Planned for Year 2001:**
 - Policy Memo for Use of Software DERs in the TSOA system (signed 4/16/01)
 - Notice on Reuse of Software Life Cycle Data (FINALIZE)
 - Notice on Reuse of Software Components (ROUTE FOR COMMENTS)
 - Mega Software Order and Advisory Circular (DRAFT)

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FAA National Software Conference, June 2001

FAA Airborne Activities

Software Training

- **Software Job Functions Course**
 - Two week course
 - For FAA, DERs, & Int'l Cert Authorities
 - Offered 2X per year
- **Annual Software Standardization Conference (June 01)**
- **Modified Condition/Decision Coverage Tutorial and Video (May 2001)**
- **Software Reuse Video (September 2001)**

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Software Training (cont)

- **Materials on the Web (on-going)**
 - Conference materials
 - Self-study guides
 - Research reports
 - Video order forms
- **Videos**
 - Software Job-aid Video
 - Software Policy Video
 - Change Impact Analysis Video
 - Software Conformity Video
 - Complex Electronic Hardware Video

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FAA Airborne Activities

FAA Software Web-Site

Software Home Page:

<http://av-info.faa.gov/software>



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RTCA Software-Related Committees

- **RTCA SC-190: DO-178B Clarification**
 - Errata
 - Frequently Asked Questions
 - Discussion Papers
 - Annual Report (DO-248, A, B)
- **RTCA SC-182: Avionics Computer Resource (completed -- DO-255)**
- **RTCA SC-180: Complex Electronic Hardware (completed -- DO-254)**



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FAA Airborne Activities

Research Tasks in Work

- **MC/DC**
 - New report on the web
- **Commercial-Off-The-Shelf (COTS) Software**
 - Hardware & Software reports coming soon
 - Starting phase 2 of software
- **Software Service History**
- **Object-Oriented Technology**
- **Case study to identify problematic areas of DO-254 and to develop training**

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FAA's Support of other Research Activities

- **NASA's Aviation Safety Program**
- **DARPA's High Confidence Software and Safety effort**
- **Aerospace Vehicle Systems Institute (AVSI) software activities**
- **FAA's Airworthiness Center of Excellence**

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FAA Airborne Activities

GAMA/AIA Software Activities

- Developing Standard for Software Used In Manufacturing
- Standard will be basis for FAA Policy/Guidance
- Kick-off -- August 1999
- Aiming for completion in 2002

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Where We're
Going
(Beyond 2001)



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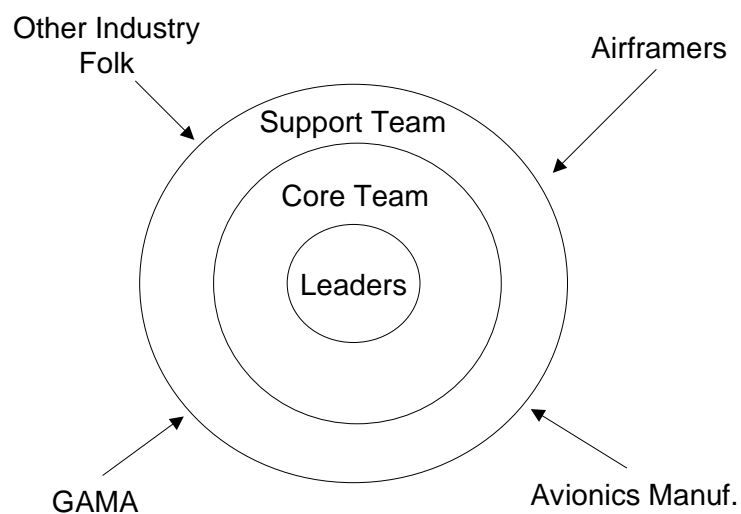
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FAA Airborne Activities

Integrated Modular
Avionics Team
(IMAT)

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IMAT Organization



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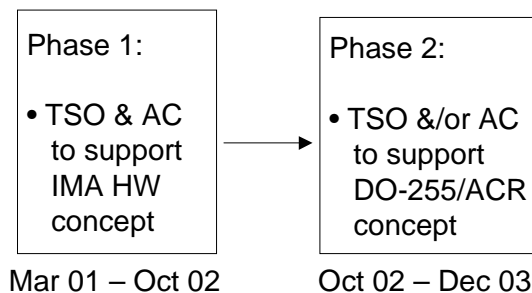
FAA Airborne Activities

IMAT Goals

- Develop & coordinate regulatory materials regarding IMA technology
- Develop guidance for both FAA & industry
- Serve as FAA focal for IMA projects

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IMAT Approach – Two Phases



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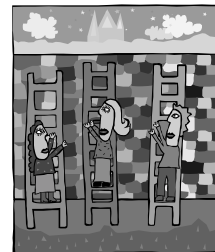
FAA Airborne Activities

Abbreviated Schedule

- Draft HW TSO – 5/01
- Draft AC – 7/01
- Publish HW TSO Fed Reg – 2/02
- Complete HW TSO – 6/02
- Publish HW AC Fed Reg – 5/02
- Complete HW AC – 10/02
- Start Phase 2, if still needed – 10/02

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Other Activities Planned



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FAA Airborne Activities

Other Activities Planned

- **Complete Mega Software AC & Order**
- **Develop Real-time Software Course**
- **Develop Training on IMA TSO and AC**
- **Continue Software Job Functions Course**
- **Continue Software Standardization Conference**

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Other Activities Planned (cont)

- **Continue Current Research**
- **Start Research in the Following Areas:**
 - **Software Development Tools**
 - **Real-Time Operating Systems**
 - **Ethernet**
- **Kick-off Efforts To Develop:**
 - **Development Tool Guidance**
 - **Object-Oriented Guidance**
 - **Tool Reuse Guidance**
 - **RTOS Guidance**

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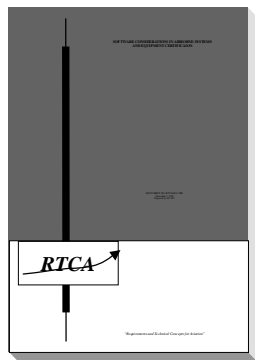
FAA Airborne Activities

Possible Workshops in 2002

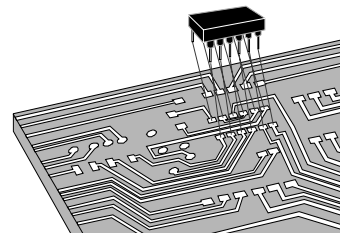
- Object-Oriented Technology
- Software Tools
 - Development, Verification, Acquisition

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Complex Electronic Hardware



- Advisory Circular
- Designee Qualifications
- Research Program
- Training/Case Study



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FAA National Software Conference, June 2001

FAA Airborne Activities

Summary

- **We have accomplished a lot**
- **We have a lot in work**
- **We have a lot planned**
- **We're striving to address and enable new advances in software technology**
- **Thanks to all who have made the AIR Software Program a success!**

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